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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4L (LESF, LEUF, LEUG, LEUX), H4F (FCW), G5C (CHX)

Int Cl (Ed.7): H04Q 7/32, G09F 13/04, /18, G09G 3/34

Other: Online: WPI, EPODOC, JAPIO, INSPEC

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A, E	GB 2354406 A	(MATSUSHITA) See page 20 line 20 - page 21 line 3.	-
A	JP 2001053839	(TOSHIBA) See English language abstract	-
X	JP 110341316	(CANON) See English language abstract	1, 16
A	JP 110205863	(NIPPON) See English language abstract	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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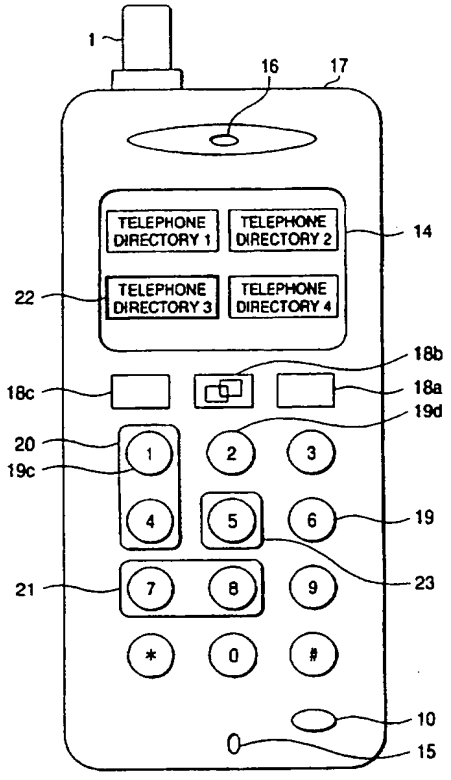
(54) Abstract Title
Telephone terminal device with scrolling function

(57) A pair of adjacent ten keys on a number pad, 19, for a telephone, are allocated as the scrolling keys in the up/down and/or left right direction. Another ten key may be used as the selection or enter key. The scrolling allocation may be indicated by providing frames 20, 21, 23 around the keys or shaping of the keys. Means may be provided for selecting the scrolling or number modes of operation. The display may have different backlighting to indicate the currently selected mode.

FIG. 5



GB 2 354 406 A

FIG. 1

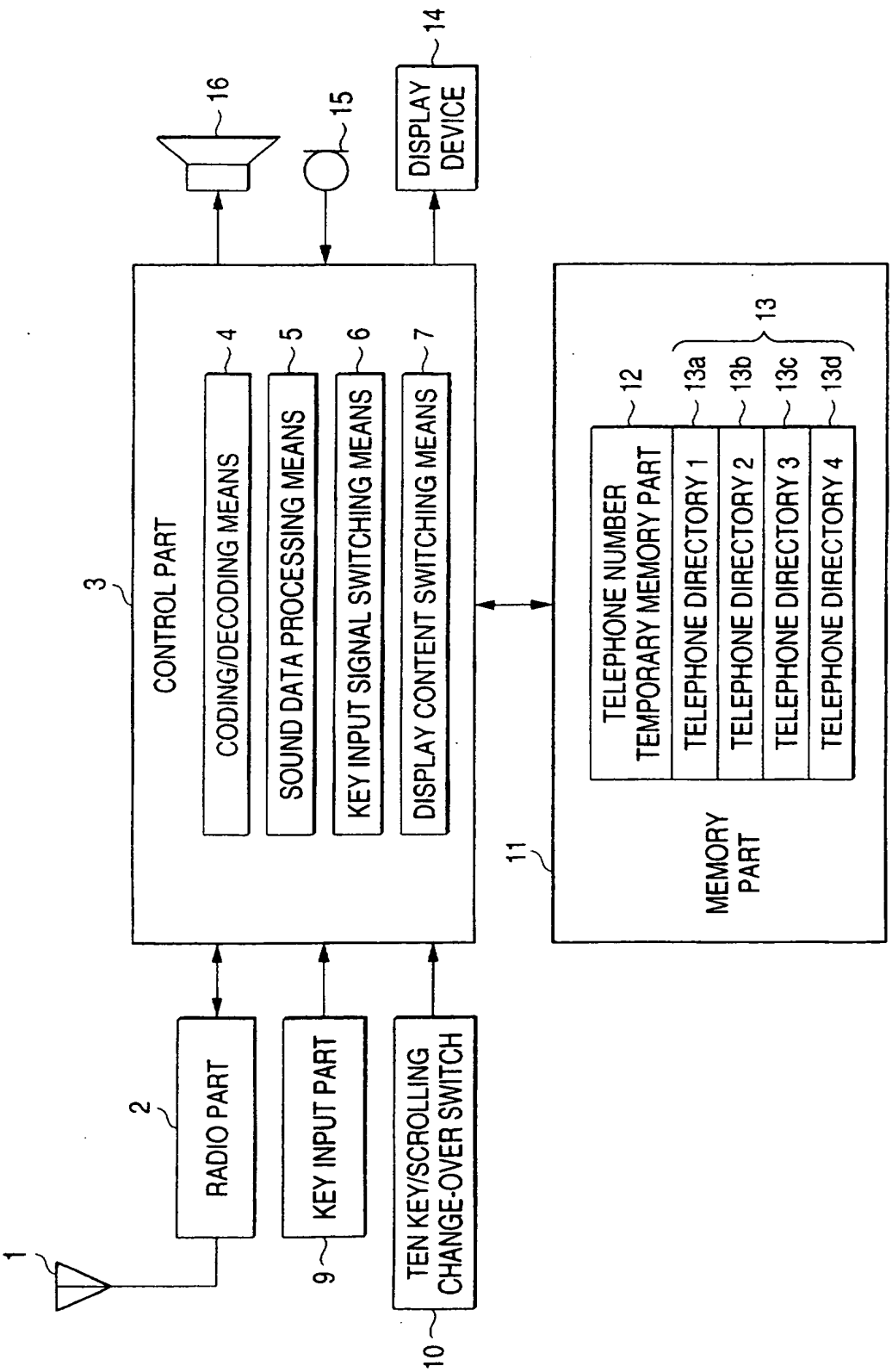

1
2
RADIO PART
9
KEY INPUT PART
10
TEN KEY/SCROLLING CHANGE-OVER SWITCH
3
CONTROL PART
4
CODING/DECODING MEANS
5
SOUND DATA PROCESSING MEANS
6
KEY INPUT SIGNAL SWITCHING MEANS
7
DISPLAY CONTENT SWITCHING MEANS
16
15
14
DISPLAY DEVICE
11
MEMORY PART
12
TELEPHONE NUMBER TEMPORARY MEMORY PART
13
13a
TELEPHONE DIRECTORY 1
13b
TELEPHONE DIRECTORY 2
13c
TELEPHONE DIRECTORY 3
13d
TELEPHONE DIRECTORY 4

FIG. 2

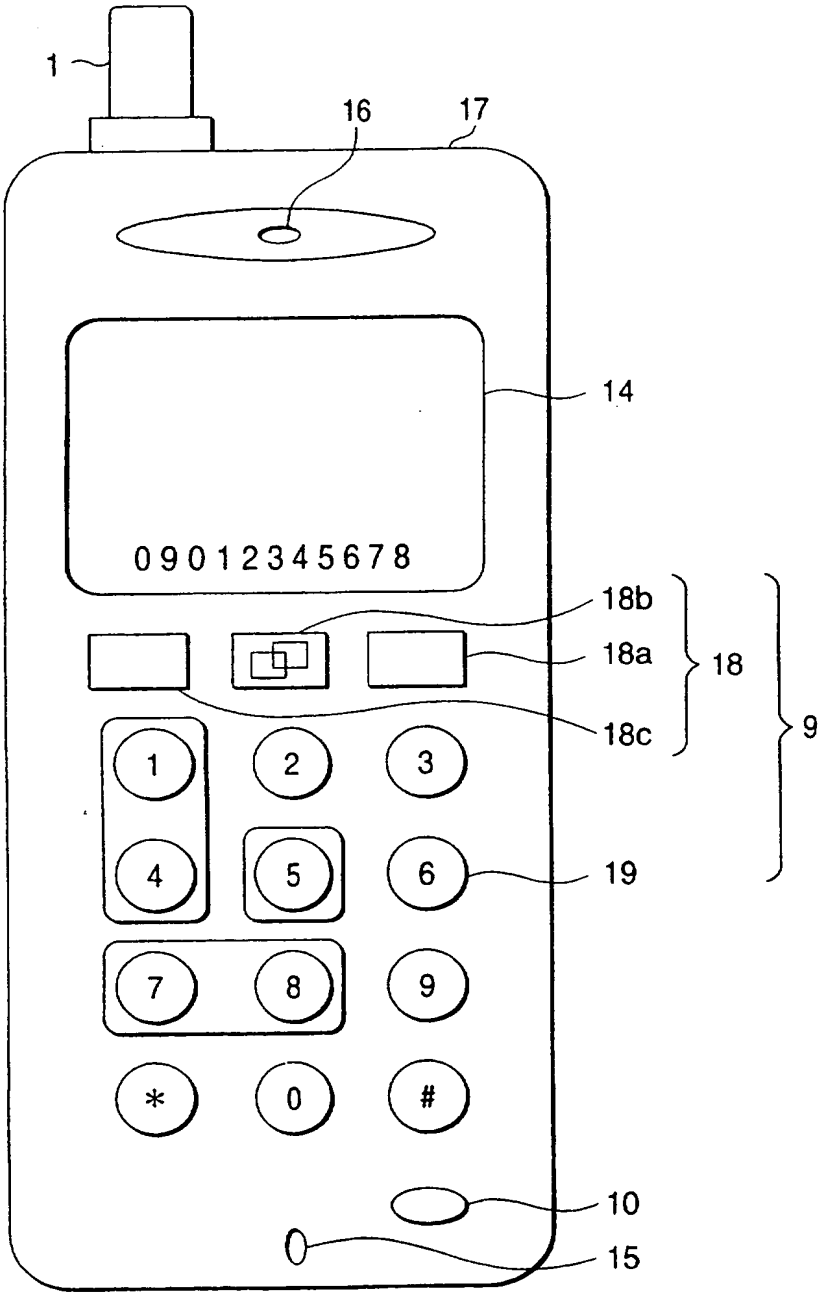


FIG. 3

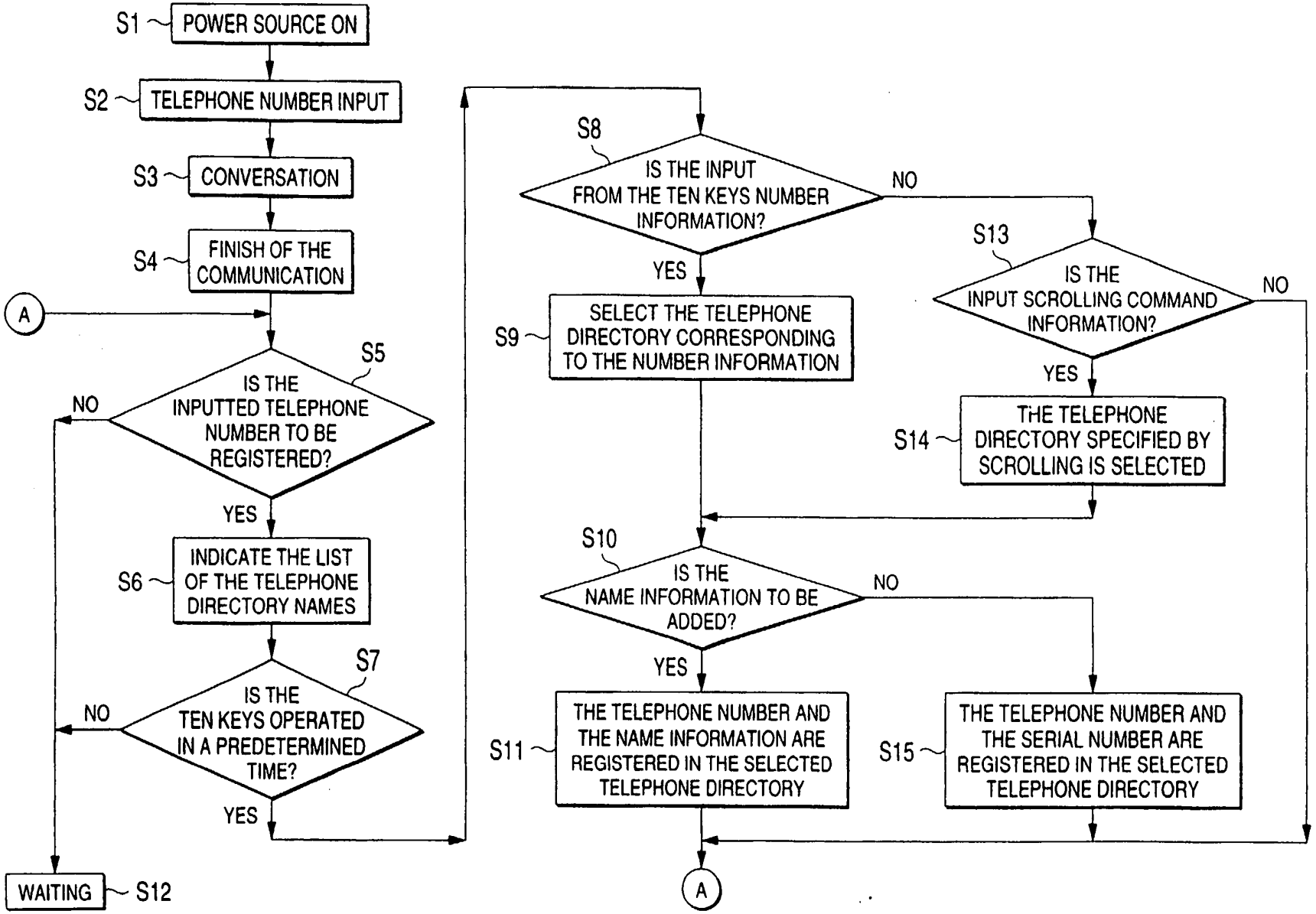

S1
POWER SOURCE ON
S2
TELEPHONE NUMBER INPUT
S3
CONVERSATION
S4
FINISH OF THE COMMUNICATION
A
S5
IS THE INPUTTED TELEPHONE NUMBER TO BE REGISTERED?
NO
YES
S6
INDICATE THE LIST OF THE TELEPHONE DIRECTORY NAMES
S7
IS THE TEN KEYS OPERATED IN A PREDETERMINED TIME?
NO
YES
WAITING
S12
S8
IS THE INPUT FROM THE TEN KEYS NUMBER INFORMATION?
NO
YES
S9
SELECT THE TELEPHONE DIRECTORY CORRESPONDING TO THE NUMBER INFORMATION
S13
IS THE INPUT SCROLLING COMMAND INFORMATION?
NO
YES
S14
THE TELEPHONE DIRECTORY SPECIFIED BY SCROLLING IS SELECTED
S10
IS THE NAME INFORMATION TO BE ADDED?
NO
YES
S11
THE TELEPHONE NUMBER AND THE NAME INFORMATION ARE REGISTERED IN THE SELECTED TELEPHONE DIRECTORY
S15
THE TELEPHONE NUMBER AND THE SERIAL NUMBER ARE REGISTERED IN THE SELECTED TELEPHONE DIRECTORY
A

FIG. 4

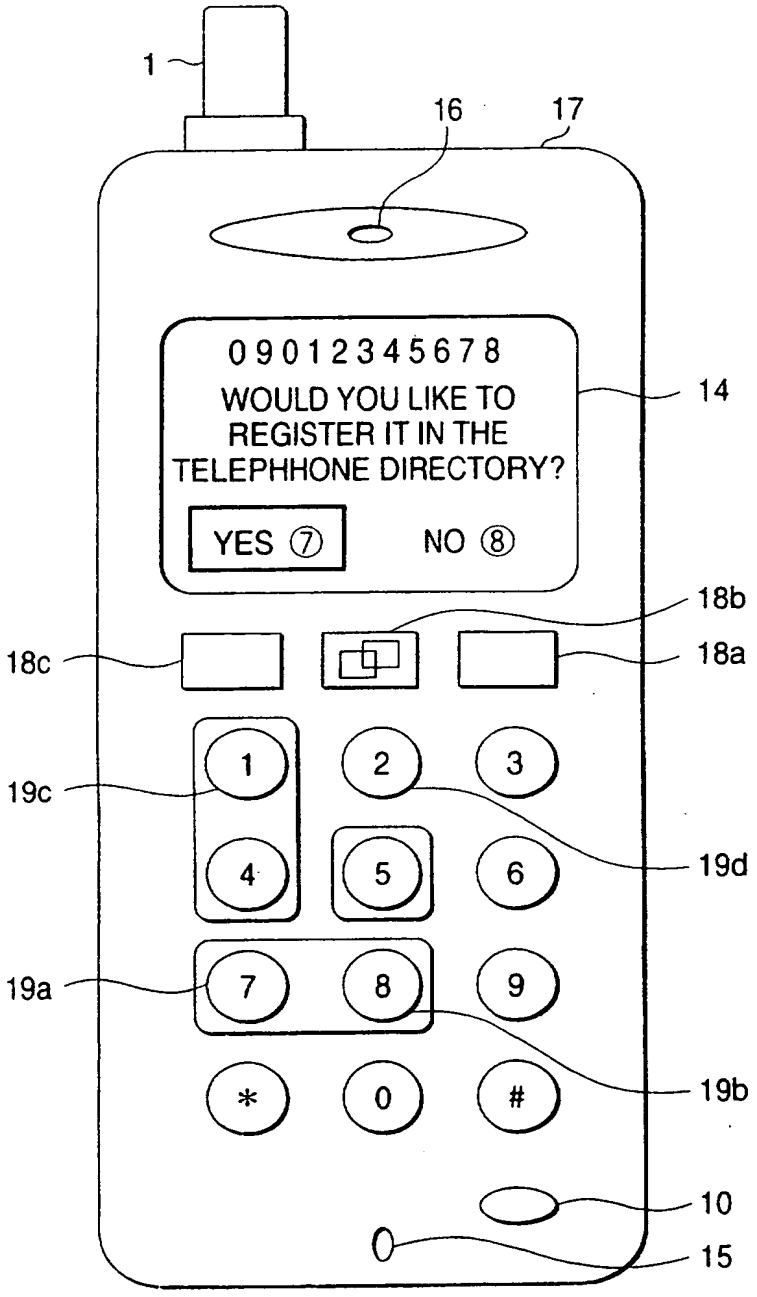

1
16
17
0 9 0 1 2 3 4 5 6 7 8
WOULD YOU LIKE TO
REGISTER IT IN THE
TELEPHHONE DIRECTORY?
YES ⑦
NO ⑧
14
18b
18c
18a
1
2
3
19c
19d
4
5
6
7
8
9
19a
19b
*
0
#
10
15

FIG. 5

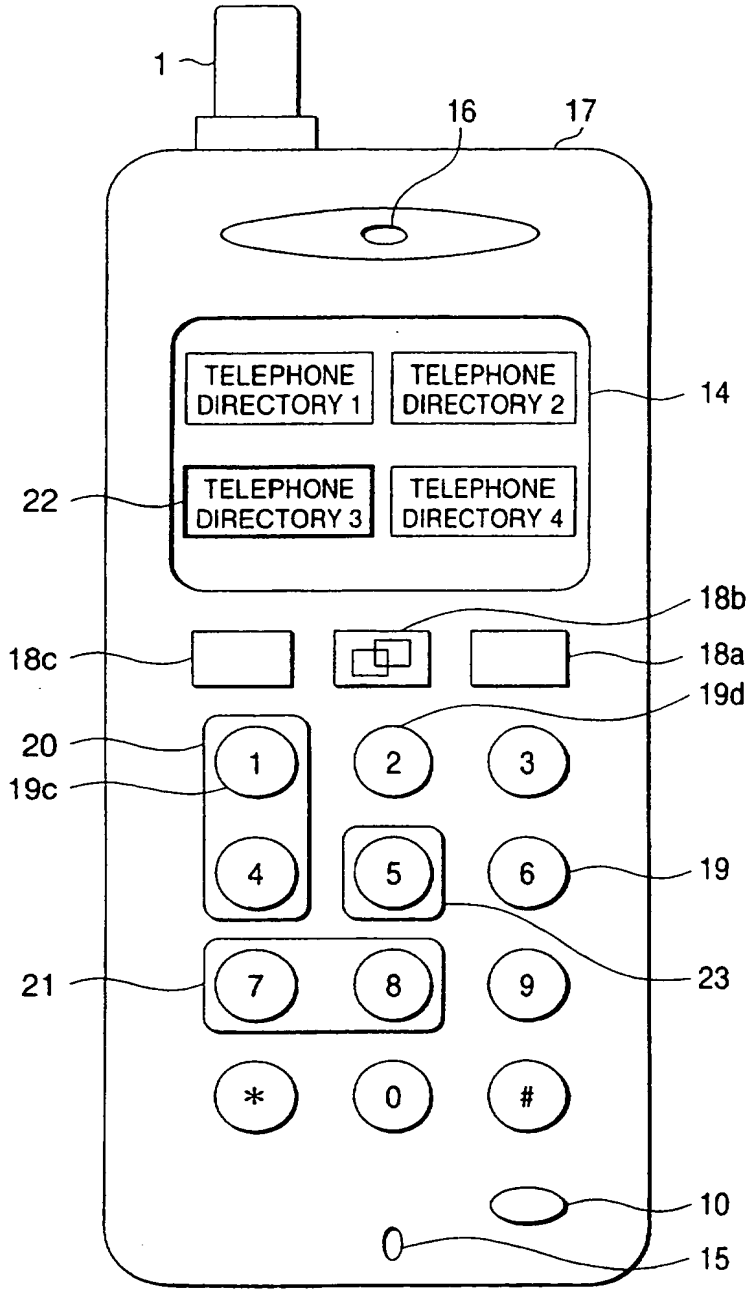

1
16
17
TELEPHONE DIRECTORY 1
TELEPHONE DIRECTORY 2
14
22
TELEPHONE DIRECTORY 3
TELEPHONE DIRECTORY 4
18b
18c
18a
19d
20
19c
1
2
3
4
5
6
19
21
7
8
9
23
*
0
#
10
0
15

FIG. 6

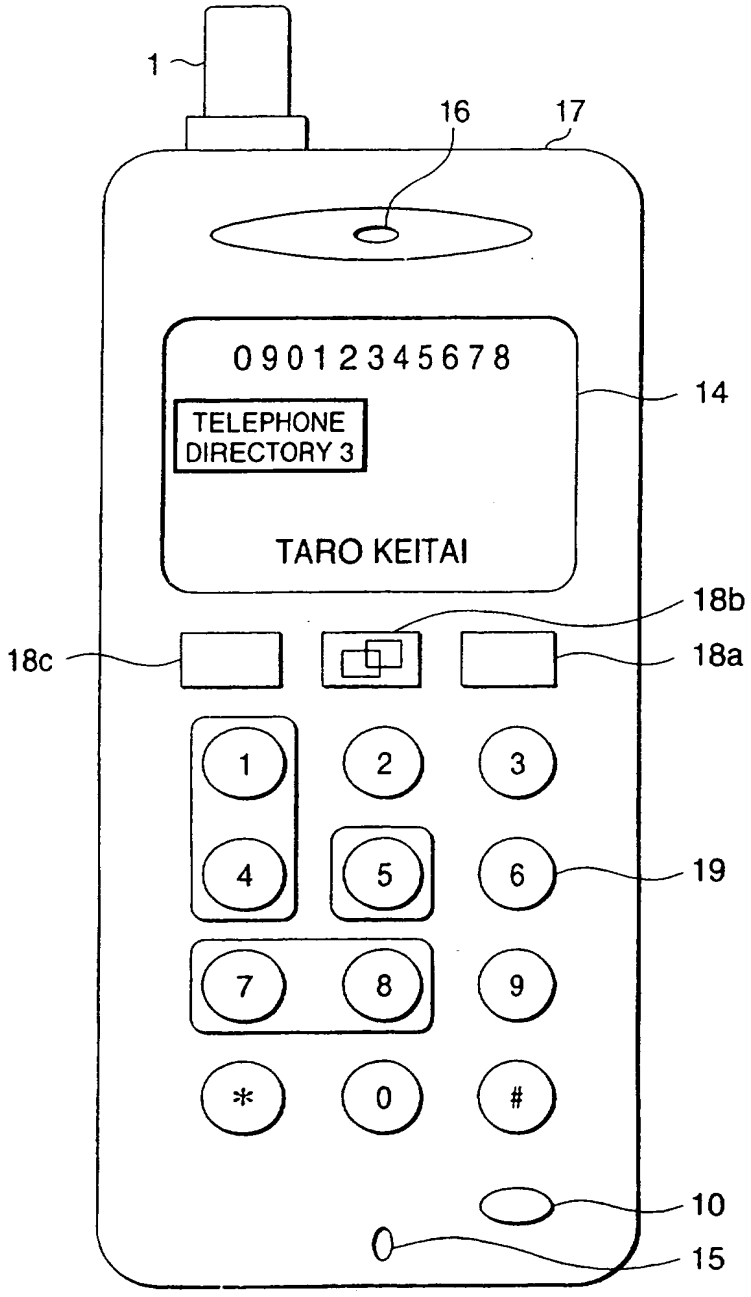

1
16
17
09012345678
TELEPHONE DIRECTORY 3
TARO KEITAI
14
18b
18c
18a
1
2
3
4
5
6
19
7
8
9
*
0
#
10
15

FIG. 7

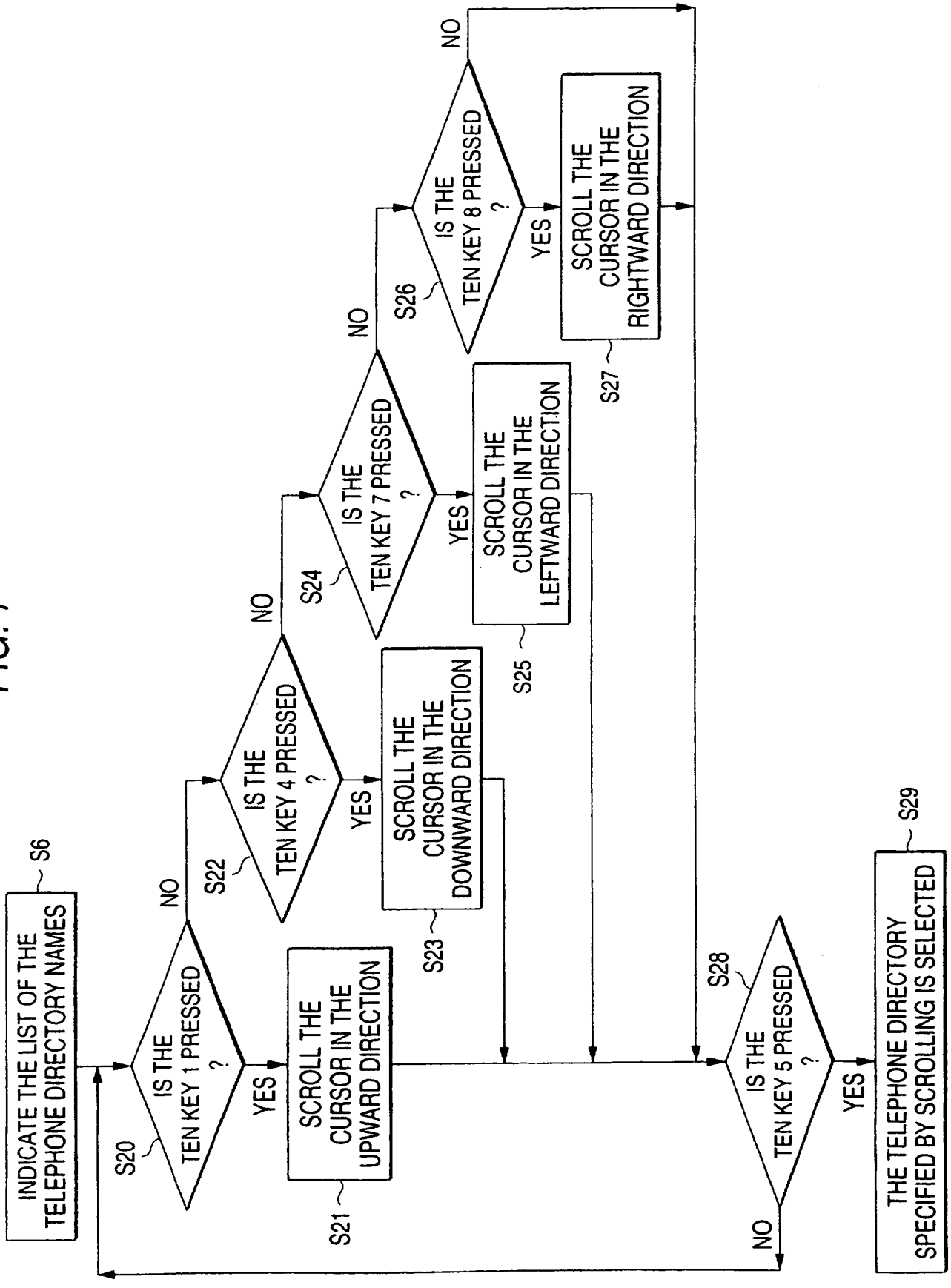

INDICATE THE LIST OF THE TELEPHONE DIRECTORY NAMES
S6
S20
IS THE TEN KEY 1 PRESSED ?
YES
S21
SCROLL THE CURSOR IN THE UPWARD DIRECTION
NO
S22
IS THE TEN KEY 4 PRESSED ?
YES
S23
SCROLL THE CURSOR IN THE DOWNWARD DIRECTION
NO
S24
IS THE TEN KEY 7 PRESSED ?
YES
S25
SCROLL THE CURSOR IN THE LEFTWARD DIRECTION
NO
S26
IS THE TEN KEY 8 PRESSED ?
YES
S27
SCROLL THE CURSOR IN THE RIGHTWARD DIRECTION
NO
S28
IS THE TEN KEY 5 PRESSED ?
YES
S29
THE TELEPHONE DIRECTORY SPECIFIED BY SCROLLING IS SELECTED
NO

FIG. 8

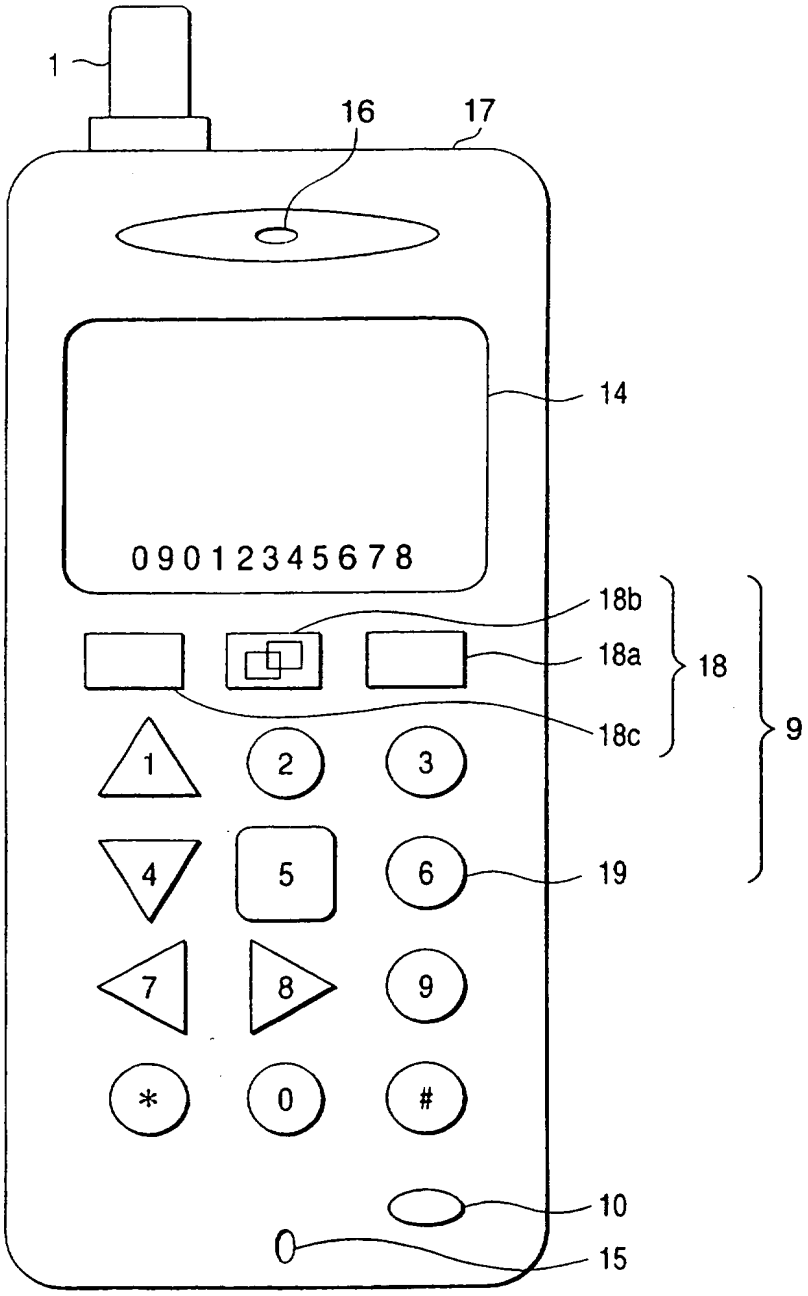


FIG. 9

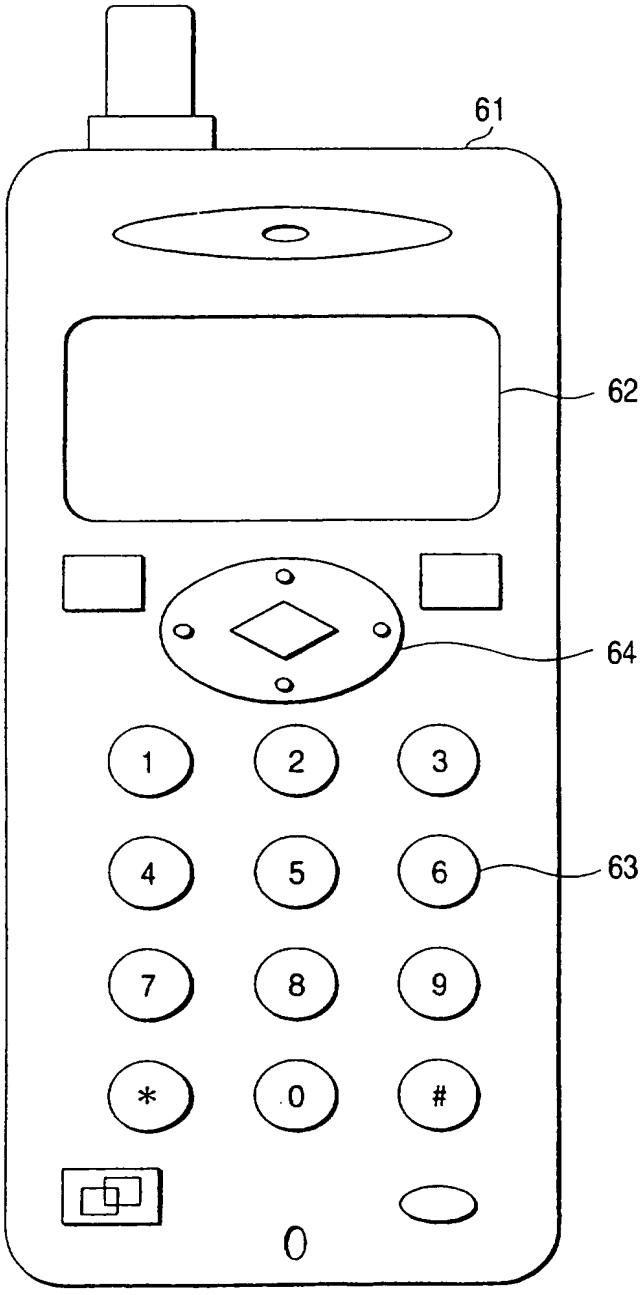
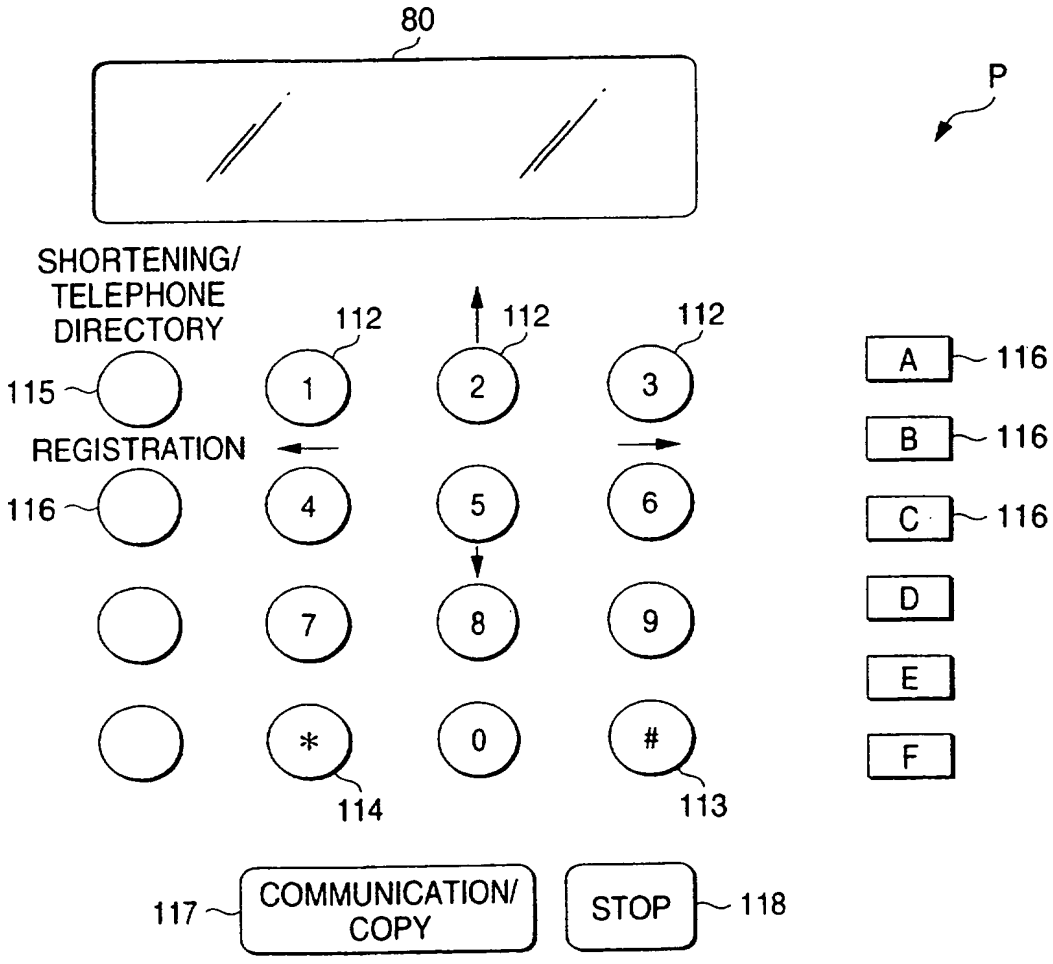


FIG. 10


80
P
SHORTENING/
TELEPHONE
DIRECTORY
115
REGISTRATION
116
112
112
112
1
2
3
4
5
6
7
8
9
*
0
#
114
113
A
B
C
D
E
F
116
116
116
117
COMMUNICATION/
COPY
STOP
118

TELEPHONE TERMINAL DEVICE WITH SCROLLING FUNCTION

The present invention relates to a portable telephone terminal device, more specifically, it relates to a telephone terminal device with a scrolling function comprising ten keys serving also as scrolling keys.

As shown in FIG. 9, some of the conventional telephone terminal devices with a scrolling function comprise a display device 62 such as a liquid crystal display device provided in a housing 61, and a dedicated scrolling key 64 independent from ten keys 63 for scrolling telephone directory data including 200 to 300 telephone numbers and names to be displayed thereon.

Furthermore, the types of the scrolling keys include those allowing selection in the two directions of the upper and lower directions, and those allowing selection in the four directions of the upper and lower, and right and left directions. For the convenience of operation with one finger, those provided as a multi-direction switch have commonly been adopted.

However, in the conventional examples, there is a strong demand for a small size and a light weight of a portable phone or a PHS (personal handy phone system) for achieving the portable handiness. On the other hand, there is a demand for enlargement of the liquid crystal display portion for indicating a large number of characters because various kinds of mail displays have been

an indispensable function. In the case the display device 62 is enlarged in the configuration with the display device 62, the ten keys 63, and the scrolling key 64 arranged vertically on the operation surface side of the housing 61, the size and the pitch of the operation keys including the ten keys 63 and the scrolling key 64 need to be smaller. As a result, with a larger display device 62, a larger number of small keys are disposed in a narrow region so that a problem arises in that the visible and handling conveniences of the keys are ruined so as to disturb the operativity.

As means for solving the problem, a jog dial as the scrolling key 64 may be provided at the side surface of the housing 61. However, for a user, who prefers the conventional operation method of manipulating with the thumb while holding the portable phone with the palm and the thumb, it is troublesome to move the thumb to the side surface of the housing 61. Besides, the method has a disadvantage in that the telephone terminal device may be dropped inadvertently when the thumb holding the telephone is opened, and thus it cannot provide a satisfactory solving method.

As another solving method, ten keys serve also as a scrolling key in the "communication terminal device" disclosed in Japanese patent publication 7-212452. FIG. 10 is a plan view of an operation panel of a conventional communication terminal device. The ten keys 112 "8", "2", "4" and "6" surrounding the key "5" at the center are used as scrolling keys. For switching

the up and down, or the right and left, for example, the operation of the "6" key from the "4" key across the "5" key, or the operation of the "8" key from the "2" key across the "5" key is required. Therefore, a problem is involved in that unlike the scrolling key 64 shown in FIG. 9, easy scroll operation in the up and down or in the right and left direction cannot be achieved by slightly moving the thumb position.

Accordingly, an object of the invention is to provide a telephone terminal device with a scrolling function having a good operativity without the need of reducing the size of the operation keys including ten keys and special keys, or the pitch among the operation keys even in the case a relatively large display device is used in a small size portable phone.

Furthermore, another object of the invention is to provide a telephone terminal device with a scrolling function having a good operativity, with the ten key operation mode of the number input mode or the scrolling mode explicitly recognizable by the user.

In order to achieve the objects, a first aspect of the invention is a telephone terminal device with a scrolling function, comprising ten keys arranged both in upper and lower, and right and left directions, wherein the function of a scrolling key is provided in the ten keys by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in

the upper and lower direction or in the right and left direction, and a switching means for switching between the ten key function and the scrolling function.

According to the configuration, a telephone terminal device with a good operativity with a large display device without the need of reducing the size or the pitch of the operation keys can be obtained.

Moreover, in a second aspect of the invention, a pair of the ten keys allocated as the scrolling keys in the upper and lower direction and a pair of the ten keys allocated as the scrolling keys in the right and left direction are disposed adjacent with each other.

According to the configuration, the scrolling operation can be enabled in the up and down direction or in the right and left direction merely by moving the finger position without changing the gripping form of the telephone terminal device.

Furthermore, in a third aspect of the invention, among the pairs of the ten keys allocated as the scrolling keys in the upper and lower direction, and in the right and left direction, the pair of the ten keys disposed in the upper and lower direction serve as the scrolling keys in the upper and lower direction, and the pair of the ten keys disposed in the right and left direction serve as the scrolling keys in the right and left direction.

According to the configuration, since the ten keys surrounded by a frame in the up and down direction serve as the

scrolling keys in the up and down direction and the ten keys surrounded by a frame in the right and left direction serve as the scrolling keys in the right and left direction, the operation mistake of the keys in the up and down direction and the keys in the right and left direction can be avoided according to the indication of the scrolling directions.

Moreover, a fourth aspect of the invention is a telephone terminal device with a scrolling function, comprising ten keys arranged both in upper and lower, and right and left directions, wherein the function of a scrolling key is provided in the ten keys by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in the upper and lower direction or in the right and left direction, a display means for visually displaying the allocation of the scrolling keys, and a switching means for switching between the ten key function and the scrolling function.

According to the configuration, since the pairs can be recognized easily among a plurality of the ten keys, the handling convenience can be improved.

Furthermore, in a fifth aspect of the invention, the display means is an indication on the surface of the housing provided by surrounding the pair of the ten keys by a frame.

According to the configuration, since the pair of the ten keys are surrounded by a frame, the surrounded ten keys can easily be recognized as the keys allocated as the scrolling keys.

Moreover, in a sixth aspect of the invention, the display means is an indication provided by applying a shape suggesting any of the upper, lower, right and left directions to the ten keys.

According to the configuration, the step of providing a frame indication surrounding the ten keys on the housing can be eliminated as well as the risk of fading of the indication due to gradual removal of the paint of the indication frame over a long term use can be avoided.

Furthermore, in a seventh aspect of the invention, one of the ten keys adjacent to the pair of the ten keys allocated as the scrolling keys in the upper and lower direction or in the right and left direction is provided as a selection switch in the scrolling state.

According to the configuration, by moving the finger position, the scrolling operation can be executed in the up and down direction or in the right and left direction as well as the selecting operation in the scrolling state can be enabled.

Moreover, an eighth aspect of the invention is a telephone terminal device with a scrolling function, comprising ten keys arranged both in upper and lower, and right and left directions, and a display device, wherein the display content of the display device is switched when the mode of the ten keys is switched from either of the number inputting mode and the scrolling command mode to the other by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in the upper

and lower direction or in the right and left direction, a switching means for switching between the ten key function and the scrolling function, and means for switching the display content of the display device, following the switching means.

According to the configuration, since the display content of the display device is switched when the number inputting mode and the scrolling command mode are switched, the number inputting operation and the scrolling operation of the ten keys can be executed without making a mistake.

Furthermore, in a ninth aspect of the invention, the display device comprises a liquid crystal display device with multi-color back lighting as well as a color switching means for switching the back lighting color, following the switching means is provided such that when the switching means switches from one to the other, the back lighting color of the display device is switched.

According to the configuration, by having different display colors on the display device, for example, in green in the number inputting mode and in red in the scrolling command mode, the present mode can accurately be recognized visually.

Particular embodiments in accordance with this invention will now be described with reference to the accompanying drawings; in which:-

FIG. 1 is a block diagram showing the circuit configuration of a telephone terminal device with a scrolling function according to an embodiment of the invention;

FIG. 2 is a plan view showing an operation surface of the

telephone terminal device shown in FIG. 1;

FIG. 3 is a flow chart of the operation of the telephone terminal device shown in FIG. 1;

FIG. 4 is a plan view of the operation surface of FIG. 2 with a message indicated on the display device;

FIG. 5 is a plan view of the operation surface of FIG. 4 with telephone directories indicated on the display device;

FIG. 6 is a plan view of the operation surface of FIG. 5 with a name indicated on the display device;

FIG. 7 is a flow chart of the scrolling operation of FIG. 3;

FIG. 8 is a plan view showing a modified embodiment of the ten keys of the portable telephone device shown in FIG. 2;

FIG. 9 is a plan view showing an operation surface of a conventional portable telephone device; and

FIG. 10 is a plan view of an operation panel of a conventional communication terminal device.

In FIG. 1, numeral 1 denotes an antenna, 2 a radio part for transmission or receipt via the antenna, and 3 a control part comprising a coding/decoding means 4 for a transmitted or received signal, a sound data processing means 5, a key input signal switching means 6, and a display content switching means 7 for

switching the display content on the display device.

Numeral 9 denotes a key input part comprising ten keys and special keys, and 10 a ten key/scrolling change-over switch. Numeral 11 is a memory part comprising a telephone number temporary memory part 12 for temporarily storing a telephone number inputted from the key input part 9, and telephone directory memories 13a, 13b, 13c, and 13d each for storing telephone directory data of four telephone directories "telephone directory 1", "telephone directory 2", "telephone directory 3", and "telephone directory 4". Numeral 14 denotes the display device, 15 a transmitter part comprising a microphone, and 16 a receiver part comprising a speaker.

In FIG. 2, the antenna 1, the transmitter part 15, the receiver part 16, the display device 14, the key input part 9 comprising special keys 18a, 18b, 18c, and ten keys 19, and the ten key/scrolling change-over switch 10 are disposed in the housing 17. An example of a 11-digit telephone number is shown on the display device 14.

Next, the operation will be explained.

An operation example of registering in the telephone directory the telephone number inputted with the ten keys 19 at the time of calling will be explained with reference to the drawings.

As shown in the flow chart of FIG. 3, the operation of registering in the telephone directory the telephone number

inputted with the ten keys 19 at the time of calling is as follows.

The power source button 18a, one of the special keys in the telephone terminal device as shown in FIG. 2, is pressed so as to turn on the power source (step 1, hereinafter abbreviated as S1).

The telephone number is inputted with the ten keys 19 (S2).

The communication button 18c is pressed for calling and starting the conversation (S3).

When the conversation is finished, the button 18a serving as both power source button and finish button is pressed for finishing the communication (S4).

After finishing the communication, as shown on the display device 14 in FIG. 4, the "telephone number " (same as FIG. 2), the message "Would you like to register it in the telephone directory?", and the choices "YES (7)" and "NO (8)" are indicated for inquiring of the user which of the choices is to be selected (S5).

To the inquiry, the user inputs either "YES" by pressing "7" of the ten key 19a or "NO" by pressing "8" of the ten key 19b.

In the case the answer is "YES", as shown on the display device 14 in FIG. 5, a list of the telephone directory names of "telephone directory 1", "telephone directory 2", "telephone directory 3", and "telephone directory 4" is indicated as four blocks (S6).

The user selects the telephone directory for the

registration from the "telephone directory 1" to "telephone directory 4". For the selection, the "telephone directory 1" can be selected by pressing "1" of the ten key 19c, and the "telephone directory 2" can be selected by pressing "2" of the ten key 19d.

In the case the ten keys 19 are operated by the user in a predetermined time (S7) and the input from the ten keys 19 is the number information (S8), the telephone directory corresponding to the number is selected as the telephone directory for the registration (S9).

In the case the name information is to be added (S10), for example, the name information such as "Taro Keitai" as shown in FIG. 6 is registered in the telephone directory selected in S9 with the telephone number inputted by the user (S11).

Thereafter, the flow chart returns to the point A for the judgment on whether or not it is to be registered further in another telephone directory (S5).

In the case it is not to be registered further in another telephone directory, the device comes out from the registration flow so as to be in the waiting state for calling or receipt (S12).

The case of the above-mentioned operation with the ten key 19 function switched to the scrolling function will be explained.

The case of the operation switched to the scrolling function is the process at S13 and thereafter.

First, in S6 with the list of the telephone directory names

displayed on the display device 14 as shown in FIG. 5, the user presses the ten key/scrolling change-over switch 10.

In the case the user presses the ten key/scrolling change-over switch 10, the signal inputted from the ten keys 19 is processed from the number information to the scrolling information by the key input signal switching means 6 (FIG. 1) in the control part 3. In this case, since the information inputted from the ten keys 19 is not number information (S8), the information inputted from the ten keys 19 is confirmed to be the scrolling command information (S13).

In the case it is the scrolling command information, the telephone directory specified in scrolling is selected as the telephone directory for registering the data (S14).

Thereafter, addition of the name information is processed according the procedure from S10 on.

The sub routine shown in FIG. 7 is a flow chart of a specific scrolling operation method showing in what way the scrolling direction is commanded according to the press of either of the ten keys "1", "4", "7" and "8" with the key input switched after the display of the list of the telephone directory names.

After switching the key input according to the press of the ten key/scrolling change-over switch 10;

in the case the "1" key is pressed (S20), the cursor moves upward for scrolling (S21);

in the case the "4" key is pressed (S22), the cursor moves

downward for scrolling (S23);

in the case the "7" key is pressed (S24), the cursor moves leftward for scrolling (S25);

in the case the "8" key is pressed (S26), the cursor moves rightward for scrolling (S27).

As mentioned above, the scrolling operation is executed by the "1" and "4" keys in the up and down direction, and by the "7" and "8" keys in the right and left direction. As shown in FIG. 5, since the indication is given such that the "1" and "4" keys are surrounded by a frame 20 as a pair, and the "7" and "8" keys are surrounded by a frame 21 as a pair as well as the "1" and "4" ten keys are disposed in the up and down direction and the "7" and "8" ten keys are disposed in the right and left direction, that is, in the same directions as the scrolling directions, the scrolling keys in the up and down direction and in the right and left direction can be recognized explicitly. Therefore, compared with the conventional examples, the risk of the operation mistake can be avoided.

Moreover, in this embodiment, the "5" ten key adjacent to the ten keys "1", "4", "7" and "8" is used as the selection switch for selecting the telephone directory for the registration. As shown in FIG. 5, the ten key "5" is surrounded by a frame 23 for the selection switch indication for being distinguished from the other ten keys. In FIG. 5, the thick line indicated on the display device 14 is the cursor 22 to be used for scrolling among

the "telephone directory 1" to "telephone directory 4". FIG. 5 shows the state with the cursor 22 at the "telephone directory 3". In the case the selection switch "5" is pressed in this state (S28), the "telephone directory 3" is selected as the telephone directory for the registration (S29).

Thereafter the same process as in S10 and thereafter shown in FIG. 3 is executed. As shown in FIG. 6, the "telephone number" and the "name = Taro Keitai" will be registered in the selected "telephone directory 3".

Moreover, by providing the display device 14 comprising a liquid crystal display device having back lighting with a multi-color switching function (not illustrated) on the rear surface such that the back lighting color can be switched (for example, from red to green) by the display content switching means 7 of the control part 3, following the ten key/scrolling change-over switch 10, the kind of the ten key operation mode can be presented to the user by the back lighting color of the display device 14 so as to prevent a pressing mistake of the user.

According to the present embodiment, since the ten keys "1", "4", "7", "8" and "5" are adjacent with each other, in the case of the conventional holding style of the housing 17 between the palm and the thumb, since the operation can be enabled only by slightly moving the position of the thumb, the operativity in the scrolling operation can be improved compared with the conventional examples.

Although the method of pressing the ten key/scrolling change-over switch 10 by the user is presented in this embodiment as an example of the method for switching the handling manner of the information inputted from the ten keys 19 in the control part 3, if it is switched such that the information inputted from the ten keys is processed not as the number information but as the scrolling command information automatically in the case the operation screen is switched to the one for scrolling with the cursor as the display screen shown in FIG. 5, the operation with a further improved handling convenience can be realized.

Moreover, although the basic form of the telephone directory registration procedure with the four registration groups of the "telephone directory 1" to "telephone directory 4" and the registering content of the 11-digit "telephone number" and the "name" has been explained in this embodiment, it is not limited thereto. It shows only the basic form, and, for example, the number of the groups can be increased in the group registration with the identification function like those executed currently in various kinds of the portable telephone devices. Further, as to the registration content, in addition to the "telephone number" and the "name", the invention can be adopted in various other forms of the telephone directories and memory dials executed in the portable telephone devices, such as addition of the "address, birthday, blood type, or the like", and registration by a shortened dial.

Furthermore, although the back lighting color of the display device is switched, following the ten key/scrolling change-over switch in this embodiment, since the back light emits a light by the EL (electro-luminescence), or the like, it is not limited to the two-color change-over in the red and green colors, but any color, such as blue and orange can be adopted. In the case of a group registration with an identification function, for example, the back lighting display can be changed at the time of receipt, depending on the group.

In FIG. 5, an indication is provided such that the "1" and "4" keys are surrounded by the frame 20 as the pair, and the "7" and "8" keys are surrounded by the frame 21 as the pair. Instead of this, an indication can be provided as shown in FIG. 8. That is, in FIG. 8, the ten keys "1", "4", "7" and "8" have a shape different from the other ten keys. The other ten keys (0, 2, 3, 6, and 9) have a round shape, whereas:

the ten key "1" has a triangular shape pointing the upward direction;

the ten key "4" has a triangular shape pointing the downward direction;

the ten key "7" has a triangular shape pointing the leftward direction; and

the ten key "8" has a triangular shape pointing the rightward direction.

Accordingly, since each ten key suggests its own

scrolling direction by the shape, the operator can explicitly recognize the scrolling key in the up and down or right and left directions only with the ten keys. Therefore, the operation mistake can be prevented as well as the step of surrounding the ten keys with an indication frame on the housing can be eliminated, and further, the problem of fading of the indication due to gradual removal of the paint of the indication frame over a long term use can be avoided.

Similarly, in FIG. 8, the ten key "5" adjacent to the ten keys "1", "4", "7", and "8" is provided with a shape different from the other ten keys (herein a square shape). Accordingly, the use of the ten key "5" as the selection switch for selecting the telephone directory for the registration is indicated. According to the indication with the shape, the step of surrounding the ten keys with an indication frame on the housing can be eliminated as well as the problem of fading of the indication due to gradual removal of the paint of the indication frame over a long term use can be avoided.

As heretofore explained, since the invention provides a telephone terminal device with a scrolling function, comprising ten keys arranged both in upper and lower, and right and left directions, wherein the function of a scrolling key is provided in the ten keys by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in the upper and lower direction or in the right and left direction, and

a switching means for switching between the ten key function and the scrolling function, a telephone terminal device with a good operativity with a large display device without the need of reducing the size or the pitch of the operation keys can be obtained.

Moreover, since a pair of the ten keys allocated as the scrolling keys in the upper and lower direction and a pair of the ten keys allocated as the scrolling keys in the right and left direction are disposed adjacent with each other, the scrolling operation can be enabled in the up and down direction or in the right and left direction merely by moving the finger position without changing the gripping form of the telephone terminal device.

Furthermore, among the pairs of the ten keys allocated as the scrolling keys in the upper and lower direction, and in the right and left direction, since the pair of the ten keys disposed in the upper and lower direction serve as the scrolling keys in the upper and lower direction, and the pair of the ten keys disposed in the right and left direction serve as the scrolling keys in the right and left direction, the operation mistake of the keys in the up and down direction and the keys in the right and left direction can be avoided according to the indication of the scrolling directions.

Moreover, since the invention further provides a telephone terminal device with a scrolling function, comprising

ten keys arranged both in upper and lower, and right and left directions, wherein the function of a scrolling key is provided in the ten keys by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in the upper and lower direction or in the right and left direction, a display means for visually displaying the allocation of the scrolling keys, and a switching means for switching between the ten key function and the scrolling function, the pairs can be recognized easily among a plurality of the ten keys, the handling convenience can be improved.

Furthermore, since the display means is an indication on the surface of the housing provided by surrounding the pair of the ten keys by a frame, the surrounded ten keys can easily be recognized as the keys allocated as the scrolling keys.

Moreover, since the display means is an indication provided by applying a shape suggesting any of the upper, lower, right and left directions to the ten keys, the step of providing a frame indication surrounding the ten keys on the housing can be eliminated as well as the risk of fading of the indication due to gradual removal of the paint of the indication frame over a long term use can be avoided.

Furthermore, since one of the ten keys adjacent to the pair of the ten keys allocated as the scrolling keys in the upper and lower direction or in the right and left direction is provided as a selection switch in the scrolling state, by moving the finger

position, the scrolling operation can be executed in the up and down direction or in the right and left direction as well as the selecting operation in the scrolling state can be enabled.

Moreover, since the invention further provides a telephone terminal device with a scrolling function, comprising ten keys arranged both in upper and lower, and right and left directions, and a display device, wherein the display content of the display device is switched when the mode of the ten keys is switched from either of the number inputting mode and the scrolling command mode to the other by comprising means for allocating a pair of adjacent ten keys among the ten keys as the scrolling keys in the upper and lower direction or in the right and left direction, a switching means for switching between the ten key function and the scrolling function, and means for switching the display content of the display device, following the switching means, the display content of the display device is switched when the number inputting mode and the scrolling command mode are switched, and thus the number inputting operation and the scrolling operation of the ten keys can be executed without making a mistake.

Furthermore, since the display device comprises a liquid crystal display device with multi-color back lighting as well as a color switching means for switching the back lighting color, following the switching means is provided such that when the switching means switches from one to the other, the back lighting color of the display device is switched, by having different

display colors on the display device, for example, in green in the number inputting mode and in red in the scrolling command mode, the present mode can accurately be recognized visually.

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CLAIMS

1. A telephone terminal device with a scrolling function, comprising

ten keys arranged in a two-dimensional array extending in both upper and lower, and right and left directions;

means for allocating a pair of adjacent keys among the ten keys as the scrolling keys in the upper and lower direction or in the right and left direction; and,

switching means for switching between the ten key function and the scrolling function.

2. A telephone terminal device with a scrolling function according to claim 1, wherein a pair of the ten keys are allocated as the scrolling keys in the upper and lower direction and another pair of the ten keys are allocated as the scrolling keys in the right and left direction.

3. A telephone terminal device with a scrolling function according to claim 1 or 2, wherein a pair of adjacent keys in the upper and lower direction serve as the scrolling keys in the upper and lower direction, and a pair of adjacent keys in the right and left direction serve as the scrolling keys in the right and left direction.

4. A telephone terminal device with a scrolling function according to any one of the preceding claims, also includes:

display means for visually displaying the allocation of the scrolling keys.

5. A telephone terminal device with a scrolling function according to claim 4, wherein the display means is an indication on the surface of the housing provided by surrounding the or each pair of the keys that perform a scrolling function by a frame.

6. A telephone terminal device with a scrolling function according to any one of claims 1 to 4, wherein the display means is an indication provided by applying an appropriate shape suggesting the upper, lower, right and left directions to the keys that perform a scrolling function.

7. A telephone terminal device with a scrolling function according to any of the preceding claims, wherein one of the ten keys adjacent to a pair of keys allocated as scrolling keys operates as a selection switch in the scrolling state.

8. A telephone terminal device with a scrolling function according to any one of the preceding claims, also including:

display device; and,

means for switching the display content of the display device, following the switching means,

wherein the display content of the display device is switched when the mode of the ten keys is switched from the number inputting mode to the scrolling command mode and vice versa.

9. A telephone terminal device with a scrolling function according to claim 8, wherein the display device comprises a liquid crystal display device with multi-color back lighting as well as a color switching means for switching the back light color, following the switching means is provided such that when the switching means switches from one to the other, the back lighting color of the display device is switched.

10. A telephone terminal device substantially as described with reference to Figures 1 to 8 of the accompanying drawings.

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Application No: GB 0013219.1
Claims searched: 1-10

Examiner: Robert Shorthouse
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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4L (LEUF), G4H (HKN), H4K (KFH, KBKX, KBHX)

Int Cl (Ed.7): H04M 1/247, /274

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, P	JP 2000032110	(HITATCHI) See figures 2 and 13-16	1
X	JP 070212452	(MURATA) See figure 2	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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